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## 1 Routine/Function Prologues

### 1.0.1 noah\_alb.F90: (Source File: noah\_alb.F90)

This subroutine takes quarterly surface albedo (snow-free) data and day to interpolate and determine the actual value of the albedo for that date. This actual value is then returned to the main program. The assumption is that the data point is valid for the dates of January 31, April 30, July 31, and October 31.

#### REVISION HISTORY:

28 Apr 2002: K. Arsenault; Added NOAH LSM to LDAS, initial code

#### INTERFACE:

```
subroutine noah_alb
```

#### USES:

```
use time_module
use noah_varder      ! NOAH tile variables
use time_manager
use lisdrv_module, only : grid,tile,lis
use lis_openfileMod
use lis_indices_module
implicit none
```

#### CONTENTS:

```
zeroi=0
noahdrv%noah_aflag = 0
!-----
! Determine Dates of the quarters in terms of Year (e.g., 1999.3)
!-----
time=lis%t%time
yr=lis%t%yr
!-----
! January 31
!-----
janda=31
janmo=01
call date2time(jan31,doy1,gmt1,year,janmo,&
               janda,zeroi,zeroi,zeroi)
!-----
! April 30
!-----
aprda=30
aprmo=04
call date2time(apr30,doy1,gmt1,year,aprmo,&
               aprda,zeroi,zeroi,zeroi)
!-----
```

```
! July 31
!-----
julda=31
julmo=07
call date2time(jul31,doy1,gmt1,yr,julmo,&
               julda,zeroi,zeroi,zeroi)
!-----
! October 31
!-----
octda=31
octmo=10
call date2time(oct31,doy1,gmt1,yr,octmo,&
               octda,zeroi,zeroi,zeroi)
!-----
! Determine which two quarterly albedo files book-end model time.
!-----
```

```
if ( time.ge.jan31 .and. time.le.apr30 ) then
  qq1="01"
  qq2="02"
  qdif = apr30-jan31
  timdif = time-jan31
  albflag = 1
elseif ( time.ge.apr30 .and. time.le.jul31 ) then
  qq1="02"
  qq2="03"
  qdif = jul31-apr30
  timdif = time-apr30
  albflag = 2
elseif ( time.ge.jul31 .and. time.le.oct31 ) then
  qq1="03"
  qq2="04"
  qdif = oct31-jul31
  timdif = time-jul31
  albflag = 3
elseif ( time.ge.oct31 ) then
  qq1="04"
  qq2="01"
  qdif = (jan31+1.0)-oct31
  timdif = time-oct31
  albflag = 4
elseif ( time.lt.jan31) then
  qq1="04"
  qq2="01"
  oct31=oct31-1.0
  qdif = jan31-oct31
  timdif = time-oct31
  albflag = 5
```

```

        endif

        if(noahdrv%noah_albtime .ne. albflag) then
            noahdrv%noah_albtime = albflag
            noahdrv%noah_aflag = 1
!---
! Open the needed two quarterly snow-free albedo files
!---

        call lis_open_file(10, &
                          file=trim(noahdrv%noah_albfile)//'albedo_//QQ1//'.bfsa',&
                          status='old',form='unformatted',script='getalbedo.pl')
        call lis_open_file (11, &
                           file=trim(noahdrv%noah_albfile)//'albedo_//QQ2//'.bfsa',&
                           status='old',form='unformatted',script='getalbedo.pl')

        read(10) value1
        read(11) value2
        close(10)
        close(11)
!---
! Assign quarterly albedo fractions to each tile.
!---

        do i=1,lis%d%nch
            if((value1(tile(i)%col, tile(i)%row-lis_tnroffset).ne.-9999.000) &
               .and. (value2(tile(i)%col,tile(i)%row-lis_tnroffset)&
               .ne.-9999.000)) then
                noah(i)%albsf1= value1(tile(i)%col, tile(i)%row-lis_tnroffset)
                noah(i)%albsf2= value2(tile(i)%col, tile(i)%row-lis_tnroffset)
            endif
        enddo
    endif      ! End albflag selection
!---
! Assign albedo fractions to each tile and interpolate daily.
!---

        if (noahdrv%noah_albdchk .ne. lis%t%da) then
            noahdrv%noah_aflag = 1
            do i=1,lis%d%nch
                if (noah(i)%albsf1 .ne. -9999.000) then
                    valdif(i) = noah(i)%albsf2 - noah(i)%albsf1
                    noah(i)%albsf = (timdif*valdif(i)/qdif)+noah(i)%albsf1
                endif
            end do
            noahdrv%noah_albdchk=lis%t%da

            if(lis%o%wparam.eq.1) then
                allocate(albout(lis%d%lnc,lis%d%lnr))
                do i=1,lis%d%nch

```

```
if(grid(i)%lat*1000.ge.lis%d%kgds(4).and. &
   grid(i)%lat*1000.le.lis%d%kgds(7).and. &
   grid(i)%lon*1000.ge.lis%d%kgds(5).and. &
   grid(i)%lon*1000.le.lis%d%kgds(8)) then
  rindex = tile(i)%row - (lis%d%kgds(4)-lis%d%kgds(44)) &
  /lis%d%kgds(9)
  cindex = tile(i)%col - (lis%d%kgds(5)-lis%d%kgds(45)) &
  /lis%d%kgds(10)
  albout(cindex,rindex) = noah(i)%albsf
endif
enddo
open(32,file="albout.bin",form='unformatted')
write(32) albout
close(32)
deallocate(albout)
end if
endif ! End daily interpolation
return
```